Space Weather Forecast

Issued on Friday, 29 March 2024 at 00:44 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate-class flares (R1/R2 blackout) expected, slight chance of further Strong flares (R3 blackout).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been High with a Strong flare peaking at 28/2056 UTC from the large region in the southwest. This region has also produced 3 M-flares in the last 24 hours. This is by far the largest and most magnetically complex group, but it is becoming more difficult to assess as it approaches the limb. The other three sunspot regions are comparatively small and simple.
The recent Strong flare appeared to produce a Coronal Mass Ejection (CME) directed towards the southwest in the latest coronagraph imagery. This is yet to be assessed, but is currently thought unlikely to have a significant Earth directed component. Otherwise, no significant Earth-directed CMEs were observed over the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind has been mostly at slightly elevated levels as the CME effects from last weekend continue to decline. Wind speeds eased from around 470 km/s to near 400 km/s. The Interplanetary Magnetic Field was at weak levels. The north-south component fluctuated weakly. Geomagnetic activity was Quiet to Unsettled (Kp 2-3).

Energetic Particles / Solar Radiation: Solar radiation slightly elevated above background levels, but was well below the S1/Minor Radiation storm threshold.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate-class flare activity is expected, with a slight chance of further isolated Strong flares, most likely from the large region in the southwest. This risk then declines through Day 3 (31 Mar) as this region rotates away from the limb.

Solar Wind / Geomagnetic Activity: There are currently no significant Earth-directed CMEs forecast to arrive in the next four days. Solar winds have been at slightly elevated levels, but are showing a slow decline towards background levels, which is expected to continue as recent CME effects continue to wane. Connection to a coronal hole fast wind is possible later Day 2 into Day 3 (30-31 Mar), with speeds of around 450-500 km/s most likely.

Generally Quiet to Unsettled geomagnetic activity is expected through the period, perhaps with a slight chance of Active intervals when the fast wind arrives.
Energetic Particles / Solar Radiation: Solar radiation is now near background levels after the recent enhancement. There is a slight chance of further enhancement due to larger flares, mainly from the region in the southwest.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	60	30
Very Active	R3 to R5 X	Yes	20	20	15	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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